NEET-UG EXAMINATION PAPER-2023

(Solved)

Time allowed : 3 hours | Maximum Marks : 801

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **200 questions.** All questions are **compulsory.**

ii. This question paper is divided into **1 sections.**

iii. **Section A** – questions number **1 to 200** are multiple choice questions

iv. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.

v. Use of calculator is NOT allowed.

Section A

Question 1.

The minimum wavelength of X-rays produced by an electron accelerated through a potential difference of V volts is proportional to

[4 Marks]

(A) $1/\sqrt{V}$

(B) $1/V$

(C) V^2

(D) $\sqrt{V}$

Question 2.

A Carnot engine has an efficiency of 50% when its source is at a temperature 327°C. The temperature of the sink is

[4 Marks]

(A) 100°C

(B) 27°C

(C) 200°C

(D) 15°C

Question 3.

A bullet is fired from a gun at the speed of 280 m s^{-1} in the direction 30° above the horizontal. The maximum height attained by the bullet is (g = 9.8 m s^{-2}, sin30° = 0.5)

[4 Marks]

(A) 1000 m

(B) 3000 m

(C) 2000 m

(D) 2800 m

Question 4.

In a series LCR circuit, the inductance L is 10 mH, capacitance C is 1 µF and resistance R is 100 Ω. The frequency at which resonance occurs is

[4 Marks]

(A) 1.59 rad/s

(B) 15.9 kHz

(C) 1.59 kHz

(D) 15.9 rad/s

Question 5.

Given below are two statements:

Statement I: Photovoltaic devices can convert optical radiation into electricity.

Statement II: Zener diode is designed to operate under reverse bias in breakdown region.

In the light of the above statements, choose the most appropriate answer from the options given below.

[4 Marks]

(A) Statement I is incorrect but Statement II is correct

(B) Both Statement I and Statement II are correct

(C) Statement I is correct but Statement II is incorrect

(D) Both Statement I and Statement II are incorrect

Question 6.

Light travels a distance x in time t_1 in air and 10x in time t_2 in another denser medium. What is the critical angle for this medium?

[4 Marks]

(A) $\sin^{-1}(t_2 / t_1)$

(B) $\sin^{-1}(10t_2 / t_1)$

(C) $\sin^{-1}(t_1 / 10t_2)$

(D) $\sin^{-1}(10t_1 / t_2)$

Question 7.

In hydrogen spectrum, the shortest wavelength in the Balmer series is λ. The shortest wavelength in the Bracket series is

[4 Marks]

(A) 2λ

(B) 4λ

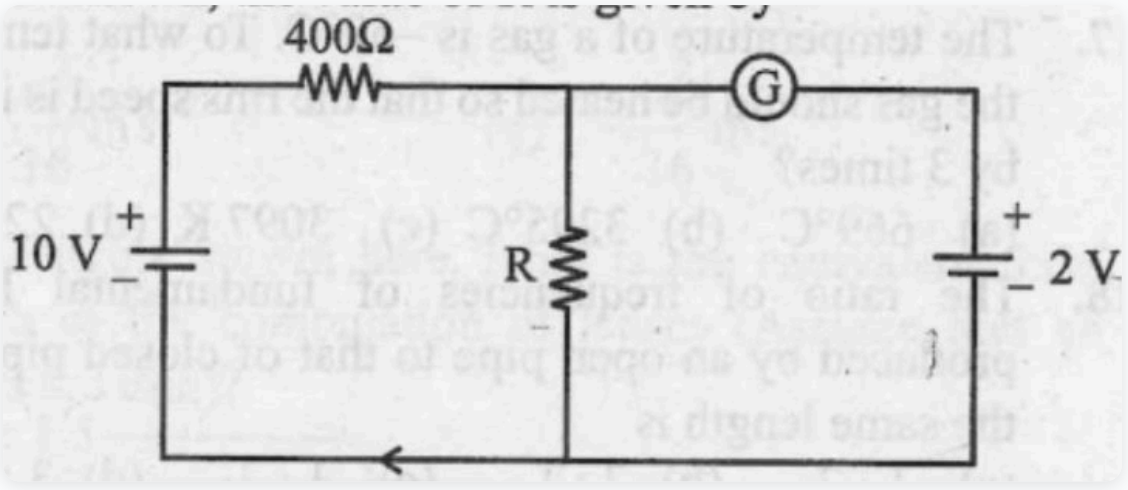
(C) 9λ

(D) 16λ

Question 8.

If the galvanometer G does not show any deflection in the circuit shown, the value of R is given by

[4 Marks]



(A) 200 Ω

(B) 400 Ω

(C) 50 Ω

(D) 100 Ω

Question 9.

The amount of energy required to form a soap bubble of radius 2 cm from a soap solution is nearly (surface tension of soap solution = 0.03 N m^{-1})

[4 Marks]

(A) 30.16×10^{-4} J

(B) 3.01×10^{-4} J

(C) 5.06×10^{-4} J

(D) 50.1×10^{-4} J

Question 10.

The magnetic energy stored in an inductor of inductance 4 μH carrying a current of 2 A is

[4 Marks]

(A) 8 μJ

(B) 8 mJ

(C) 4 mJ

(D) 4 μJ

Question 11.

A 12 V, 60 W lamp is connected to the secondary of a step-down transformer, whose primary is connected to ac mains of 220 V. Assuming the transformer to be ideal, what is the current in the primary winding?

[4 Marks]

(A) 2.7 A

(B) 0.27 A

(C) 3.7 A

(D) 0.37 A

Question 12.

An electric dipole is placed at an angle of 30° with an electric field of intensity 2×10^5 N C^{-1}. It experiences a torque equal to 4 N m. Calculate the magnitude of charge on the dipole, if the dipole length is 2 cm.

[4 Marks]

(A) 8 mC

(B) 2 mC

(C) 6 mC

(D) 4 mC

Question 13.

A vehicle travels half the distance with speed v and the remaining distance with speed 2v. Its average speed is

[4 Marks]

(A) 2v / 3

(B) v / 3

(C) 3v / 4

(D) 4v / 3

Question 14.

Let a wire be suspended from the ceiling (rigid support) and stretched by a weight W attached at its free end. The longitudinal stress at any point of cross-sectional area A of the wire is

[4 Marks]

(A) W/2A

(B) 2W/A

(C) W/A

(D) Zero

Question 15.

If $\oint_s E \cdot dS = 0$ over a surface, then

[4 Marks]

(A) All the charges must necessarily be inside the surface

(B) The electric field inside the surface is necessarily uniform

(C) The number of flux lines entering the surface must be equal to the number of flux lines leaving it

(D) The magnitude of electric field on the surface is constant

Question 16.

The work functions of Caesium (Cs), Potassium (K) and Sodium (Na) are 2.14 eV, 2.30 eV and 2.75 eV respectively. If incident electromagnetic radiation has an incident energy of 2.20 eV, which of these photosensitive surfaces may emit photoelectrons?

[4 Marks]

(A) Na only

(B) K only

(C) Both Na and K

(D) Cs only

Question 17.

The temperature of a gas is -50°C. To what temperature the gas should be heated so that the rms speed is increased by 3 times?

[4 Marks]

(A) 223 K

(B) 3097 K

(C) 3295°C

(D) 669°C

Question 18.

The ratio of frequencies of fundamental harmonic produced by an open pipe to that of closed pipe having the same length is

[4 Marks]

(A) 3 : 1

(B) 1 : 3

(C) 2 : 1

(D) 1 : 2

Question 19. Resistance of a carbon resistor determined from colour codes is (22000 ± 5%) Ω. The colour of third band must be

[4 Marks]

(A) Red

(B) Green

(C) Yellow

(D) Orange

Question 20.

For Young's double slit experiment, two statements are given below:

Statement I : If screen is moved away from the plane of slits, angular separation of the fringes remains constant.

Statement II : If the monochromatic source is replaced by another monochromatic source of larger wavelength, the angular separation of fringes decreases.

In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) Statement I is false but Statement II is true.

(B) Both Statement I and Statement II are true.

(C) Both Statement I and Statement II are false.

(D) Statement I is true but Statement II is false.

Question 21. A metal wire has mass (0.4 ± 0.002) g, radius (0.3 ± 0.001) mm and length (5 ± 0.02) cm. The maximum possible percentage error in the measurement of density will nearly be

[4 Marks]

(A) 1.2%

(B) 1.3%

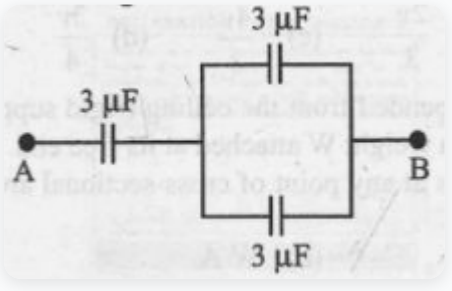
(C) 1.4%

(D) 1.6%

Question 22.

The equivalent capacitance of the system shown in the following circuit is

[4 Marks]



(A) 3 μF

(B) 2 μF

(C) 9 μF

(D) 6 μF

Question 23.

Two bodies of mass m and 9m are placed at a distance R. The gravitational potential on the line joining the bodies where the gravitational field equals zero, will be (G = gravitational constant)

[4 Marks]

(A) -20Gm / R

(B) -16Gm / R

(C) -12Gm / R

(D) -8Gm / R

Question 24.

The venturi-meter works on

[4 Marks]

(A) The principle of parallel axes

(B) Bernoulli's principle

(C) The principle of perpendicular axes

(D) Huygen's principle

Question 25.

The half life of a radioactive substance is 20 minutes. In how much time, the activity of substance drops to $(1/16)^{th}$ of its initial value?

[4 Marks]

(A) 80 minutes

(B) 60 minutes

(C) 40 minutes

(D) 20 minutes

Question 26.

A football player is moving southward and suddenly turns eastward with the same speed to avoid an opponent. The force that acts on the player while turning is

[4 Marks]

(A) Along eastward

(B) Along northward

(C) Along north-east

(D) Along south-west

Question 27.

The errors in the measurement which arise due to unpredictable fluctuations in temperature and voltage supply are

[4 Marks]

(A) Least count errors

(B) Random errors

(C) Personal errors

(D) Instrumental errors

Question 28.

The angular acceleration of a body, moving along the circumference of a circle, is

[4 Marks]

(A) Along the tangent to its position

(B) Along the radius towards the centre

(C) Along the axis of rotation

(D) Along the radius, away from centre

Question 29.

A full wave rectifier circuit consists of two p-n junction diodes, a centre-tapped transformer, capacitor and a load resistance. Which of these components remove the ac ripple from the rectified output?

[4 Marks]

(A) Load resistance

(B) p-n junction diodes

(C) Capacitor

(D) A centre-tapped transformer

Question 30. The ratio of radius of gyration of a solid sphere of mass M and radius R about its own axis to the radius of gyration of the thin hollow sphere of same mass and radius about its axis is

[5 Marks]

(A) 5 : 3

(B) √3 : √5

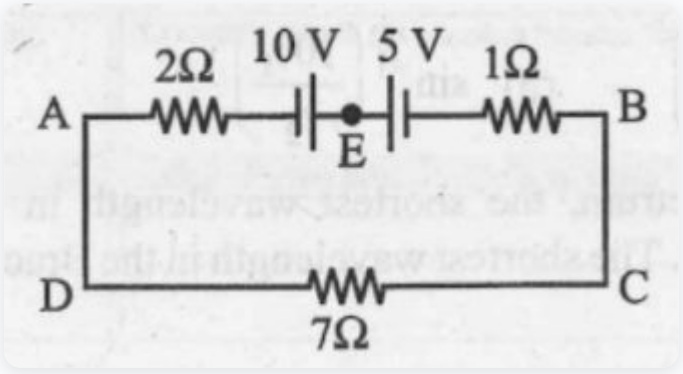
(C) 2 : 5

(D) 5 : 2

Question 31.

The magnitude and direction of the current in the following circuit is

[4 Marks]



(A) 1.5 A from B to A through E

(B) 5/9 A from A to B through E

(C) 0.5 A from A to B through E

(D) 0.2 A from B to A through E

Question 32.

An ac source is connected to a capacitor C. Due to decrease in its operating frequency

[4 Marks]

(A) Displacement current decreases

(B) Displacement current increases

(C) Capacitive reactance remains constant

(D) Capacitive reactance decreases

Question 33.

The net magnetic flux through any closed surface is

[4 Marks]

(A) Infinity

(B) Zero

(C) Positive

(D) Negative

Question 34.

In a plane electromagnetic wave travelling in free space, the electric field component oscillates sinusoidally at a frequency of 2.0×10^{10} Hz and amplitude 48 Vm^{-1}. Then the amplitude of oscillating magnetic field is (Speed of light in free space = 3×10^{8} m s^{-1})

[4 Marks]

(A) 1.6×10^{-6} T

(B) 1.6×10^{-7} T

(C) 1.6×10^{-8} T

(D) 1.6×10^{-9} T

Question 35.

The potential energy of a long spring when stretched by 2 cm is U. If the spring is stretched by 8 cm, potential energy stored in it will be

[4 Marks]

(A) 16 U

(B) 8 U

(C) 4 U

(D) 2 U

Question 36.

A bullet from a gun is fired on a rectangular wooden block with velocity u. When bullet travels 24 cm through the block along its length horizontally, velocity of bullet becomes u / 3. Then it further penetrates into the block in the same direction before coming to rest exactly at the other end of the block. The total length of the block is

[4 Marks]

(A) 30 cm

(B) 27 cm

(C) 24 cm

(D) 28 cm

Question 37. A satellite is orbiting just above the surface of the earth with period T. If d is the density of the earth and G is the universal constant of gravitation, the quantity $3\pi / Gd$ represents

[4 Marks]

(A) T

(B) T^2

(C) $\sqrt{T}$

(D) T^3

Question 38.

The radius of inner most orbit of hydrogen atom is 5.3×10^{-11} m. What is the radius of third allowed orbit of hydrogen atom?

[4 Marks]

(A) 1.59 Å

(B) 4.77 Å

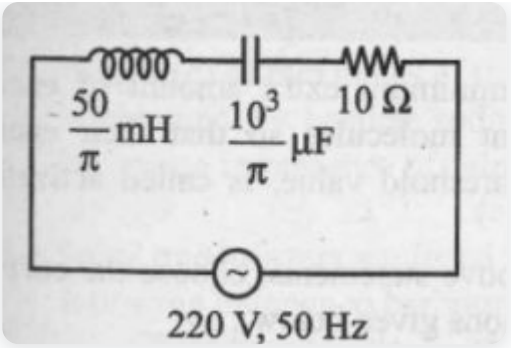
(C) 1.06 Å

(D) 0.53 Å

Question 39.

The net impedance of circuit (as shown in figure) will be

[4 Marks]



(A) 25 Ω

(B) 10√2 Ω

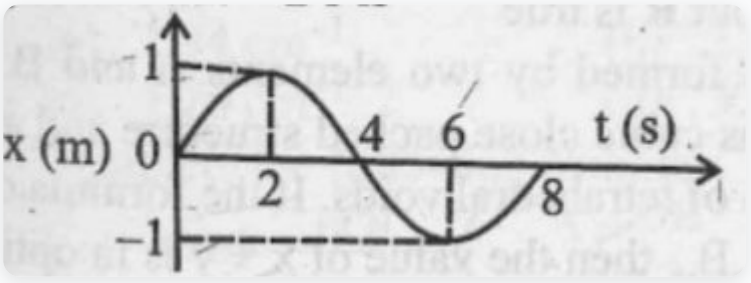
(C) 15 Ω

(D) 5√5 Ω

Question 40.

The x-t graph of a particle performing simple harmonic motion is shown in the figure. The acceleration of the particle at t = 2 s is

[4 Marks]



(A) π^2 / 8 m s^{-2}

(B) $-\pi^2$ / 8 m s^{-2}

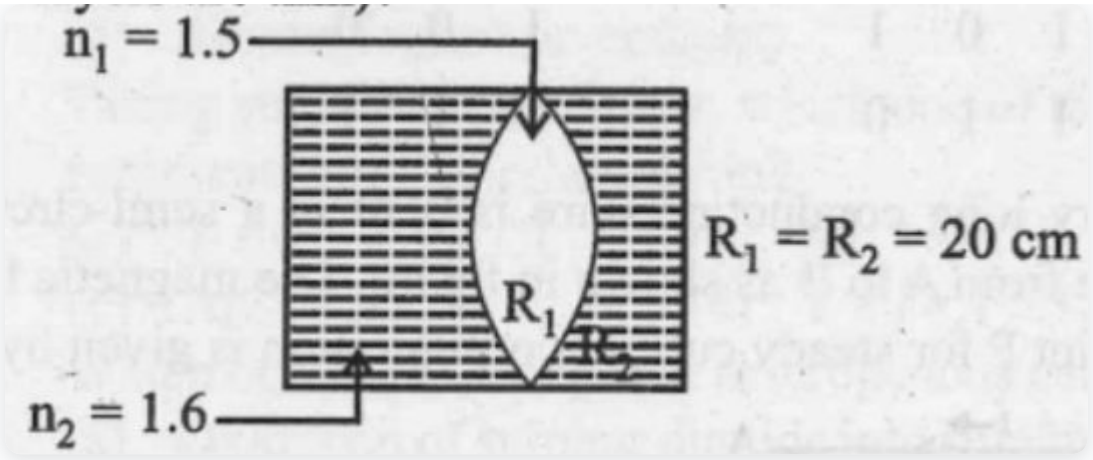
(C) π^2 / 16 m s^{-2}

(D) $-\pi^2$ / 16 m s^{-2}

Question 41.

In the figure shown here, what is the equivalent focal length of the combination of lenses (Assume that all layers are thin)?

[4 Marks]



(A) -50 cm

(B) -100 cm

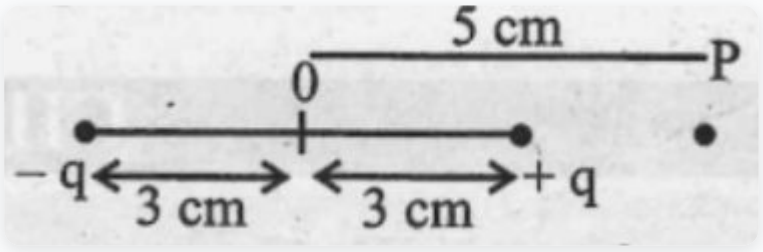
(C) 40 cm

(D) -40 cm

Question 42.

An electric dipole is placed as shown in the figure. The electric potential (in 10^2 V) at point P due to the dipole is (ε_0 = permittivity of free space and $1 / (4\pi \varepsilon_0) = K$)

[4 Marks]



(A) (8/3) qK

(B) (8/5) qK

(C) (3/8) qK

(D) (5/8) qK

Question 43. A horizontal bridge is built across a river. A student standing on the bridge throws a small ball vertically upwards with a velocity 4 m s^{-1}. The ball strikes the water surface after 4 s. The height of bridge above water surface is (Take g = 10 m s^{-2})

[4 Marks]

(A) 56 m

(B) 60 m

(C) 64 m

(D) 68 m

Question 44.

Calculate the maximum acceleration of a moving car so that a body lying on the floor of the car remains stationary. The coefficient of static friction between the body and the floor is 0.15 (g = 10 m s^{-2}).

[4 Marks]

(A) 50 m s^{-2}

(B) 1.2 m s^{-2}

(C) 1.5 m s^{-2}

(D) 150 m s^{-2}

Question 45.

10 resistors, each of resistance R are connected in series to a battery of emf E and negligible internal resistance. Then those are connected in parallel to the same battery, the current is increased n times. The value of n is

[4 Marks]

(A) 1000

(B) 1

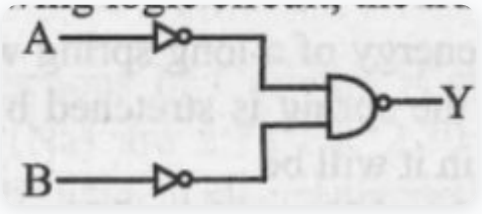
(C) 100

(D) 10

Question 46.

For the following logic circuit, the truth table is

[4 Marks]



(A)

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

(B)

A	B	Y
0	0	1
0	1	0
1	0	1
1	1	0

(C)

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

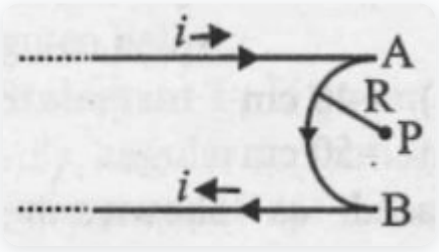
(D)

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

Question 47.

A very long conducting wire is bent in a semi-circular shape from A to B as shown in figure. The magnetic field at point P for steady current configuration is given by

[4 Marks]



(A) $\mu_0 i$ / 4R pointed into the page

(B) $\mu_0 i$ / 4R pointed away from the page

(C) $\mu_0 i$ / 4R [1 - 2/π] pointed away from page

(D) $\mu_0 i$ / 4R [1 - 2/π] pointed into the page

Question 48.

The resistance of platinum wire at 0°C is 2 Ω and 6.8 Ω at 80°C. The temperature coefficient of resistance of the wire is

[4 Marks]

(A) $3 \times 10^{-1}\ °C^{-1}$

(B) $3 \times 10^{-2}\ °C^{-1}$

(C) $3 \times 10^{-3}\ °C^{-1}$

(D) $3 \times 10^{-4}\ °C^{-1}$

Question 49.

A wire carrying a current I along the positive x-axis has length L. It is kept in a magnetic field B = (2î+3ĵ-4k̂) T. The magnitude of the magnetic force acting on the wire is

[4 Marks]

(A) 3 IL

(B) √5 IL

(C) 5 IL

(D) √3 IL

Question 50.

Two thin lenses are of same focal lengths (f), but one is convex and the other one is concave. When they are placed in contact with each other, the equivalent focal length of the combination will be

[4 Marks]

(A) f / 2

(B) f / 4

(C) Infinite

(D) Zero

Question 51.

Select the correct statements from the following

A. Atoms of all elements are composed of two fundamental particles.

B. The mass of the electron is 9.10939×10^{-31} kg.

C. All the isotopes of a given element show same chemical properties.

D. Protons and electrons are collectively known as nucleons.

E. Dalton's atomic theory, regarded the atom as an ultimate particle of matter. Choose the correct answer from the options given below

[4 Marks]

(A) A and E only

(B) B, C and E only

(C) C, D and E only

(D) A, B and C only

Question 52.

Given below are two statements :

: Assertion A : A reaction can have zero activation energy.

Reason R : The minimum extra amount of energy absorbed by reactant molecules so that their energy becomes equal to threshold value, is called activation energy. In the light of the above statements, choose the correct answer from the options given below :

[4 Marks]

(A) A is false but R is true

(B) Both A and R are true and R is the correct explanation of A

(C) A is true but R is false

(D) Both A and R are true and R is NOT the correct explanation of A

Question 53.

A compound is formed by two elements A and B. The element B forms cubic close packed structure and atoms of A occupy 1/3 of tetrahedral voids. If the formula of the compound is $A_x B_y$, then the value of x + y is in option

[4 Marks]

(A) 2

(B) 4

(C) 5

(D) 3

Question 54.

Given below are two statements :

Assertion A : Metallic sodium dissolves in liquid ammonia giving a deep blue solution, which is paramagnetic.

Reason R : The deep blue solution is due to the formation of amide. In the light of the above statements, choose the correct answer from the options given below :

[4 Marks]

(A) A is false but R is true

(B) A is true but R is false

(C) Both A and R are true and R is the correct explanation of A

(D) Both A and R are true but R is NOT the correct explanation of A

Question 55.

Amongst the following the total number of species NOT having eight electrons around central atom in its outermost shell, is NH_3, $AlCl_3$, $BeCl_2$, CCl_4, PCl_5 :

[4 Marks]

(A) 4

(B) 1

(C) 3

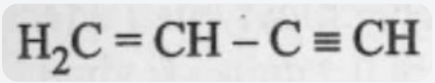
(D) 2

Question 56.

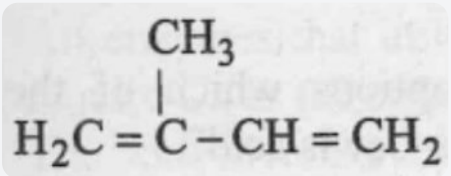
Which amongst the following molecules on polymerization produces neoprene?

[4 Marks]

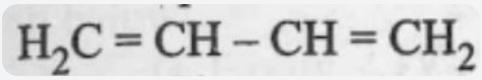
(A)



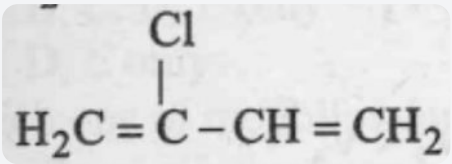
(B)



(C)



(D)



Question 57.

In Lassaigne's extract of an organic compound, both nitrogen and sulphur are present, which gives blood red colour with Fe^{3+} due to the formation of

[4 Marks]

(A) $Fe_4[Fe(CN)_6]_3 \cdot xH_2O$

(B) NaSCN

(C) $[Fe(CN)_5NOS]^{4-}$

(D) $[Fe(SCN)]^{2+}$

Question 58.

Weight (g) of two moles of the organic compound, which is obtained by heating sodium ethanoate with sodium hydroxide in presence of calcium oxide is :

[4 Marks]

(A) 16

(B) 32

(C) 18

(D) 30

Question 59. Some tranquilizers are listed below. Which one from the following belongs to barbiturates?

[4 Marks]

(A) Chlordiazepoxide

(B) Meprobamate

(C) Valium

(D) Veronal

Question 60.

The conductivity of centimolar solution of KCl at 25°C is 0.0210 ohm^{-1} cm^{-1} and the resistance of the cell containing the solution at 25°C is 60 ohm. The value of cell constant is

[4 Marks]

(A) 3.34 cm^{-1}

(B) 1.26 cm^{-1}

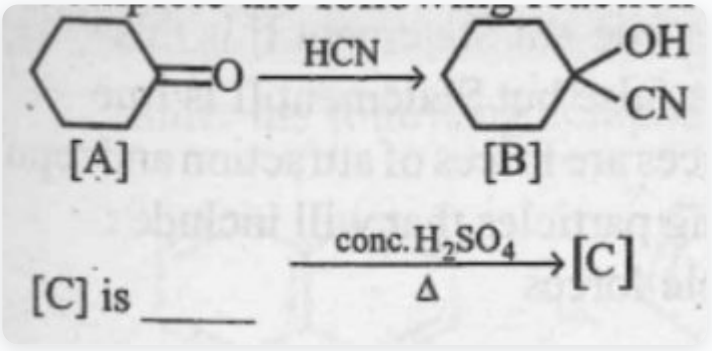
(C) 3.28 cm^{-1}

(D) 1.34 cm^{-1}

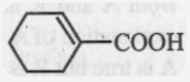
Question 61.

Complete the following reaction

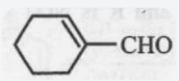
[4 Marks]



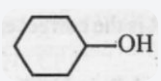
(A)



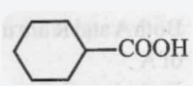
(B)



(C)



(D)



Question 62.

Homoleptic complex from the following complexes is

[4 Marks]

(A) Diamminechloridonitrito-N-platinum (II)

(B) Pentaamminecarbonatocobalt (III) chloride

(C) Potassium trioxalatoaluminate (III)

(D) Triamminetriaquachromium (III) chloride

Question 63.

The relation between n_m, (n_m = the number of permissible values of magnetic quantum number (m)) for a given value of azimuthal quantum number (l), is

[4 Marks]

(A) $n_m = l + 2$

(B) $n_m = 2l^2 + 1$

(C) $l = 2n_m + 1$

(D) $l = (n_m - 1) / 2$

Question 64.

The stability of Cu^{2+} is more than Cu^{+} salts in aqueous solution due to

[4 Marks]

(A) First ionisation enthalpy

(B) Enthalpy of atomization

(C) Hydration energy

(D) Second ionisation enthalpy

Question 65.

Taking stability as the factor, which one of the following represents correct relationship?

[4 Marks]

(A) $TlCl_3 > TlCl$

(B) $TlCl > TlCl_3$

(C) $InI_3 > InI$

(D) $AlCl > AlCl_3$

Question 66.

Which one is an example of heterogenous catalysis?

[4 Marks]

(A) Combination between dinitrogen and dihydrogen to form ammonia in the presence of finely divided iron

(B) Decomposition of ozone in presence of nitrogen monoxide

(C) Hydrolysis of sugar catalysed by H^+ ions

(D) Oxidation of sulphur dioxide into sulphur trioxide in the presence of oxides of nitrogen

Question 67.

The number of σ bonds, π bonds and lone pair of electrons in pyridine, respectively are:

[4 Marks]

(A) 11, 2, 0

(B) 12, 3, 0

(C) 12, 2, 1

(D) 11, 3, 1

Question 68.

The correct order of energies of molecular orbitals of N_2 molecule, is

[4 Marks]

(A) σ1s < σ*1s < σ2s < σ*2s < σ2p_z < σ*2p_z < (π2p_x = π2p_y) < (π*2p_x = π*2p_y)

(B) σ1s < σ*1s < σ2s < σ*2s < (π2p_x = π2p_y) < (π*2p_x = π*2p_y) < σ2p_z < σ*2p_z

(C) σ1s < σ*1s < σ2s < σ*2s < (π2p_x = π2p_y) < σ2p_z < (π*2p_x = π*2p_y) < σ*2p_z

(D) σ1s < σ*1s < σ2s < σ*2s < σ2p_z < (π2p_x = π2p_y) < (π*2p_x = π*2p_y) < σ*2p_z

Question 69.

Given below are two statements :

Assertion A : Helium is used to dilute oxygen in diving apparatus.

Reason R : Helium has high solubility in O_2. In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) Both A and R are true and R is the correct explanation of A

(B) Both A and R are true and R is NOT the correct explanation of A

(C) A is false but R is true

(D) A is true but R is false

Question 70.

For a certain reaction, the rate = $k[A]^2[B]$, when the initial concentration of A is tripled keeping concentration of B constant, the initial rate would

[4 Marks]

(A) Decrease by a factor of nine

(B) Increase by a factor of three

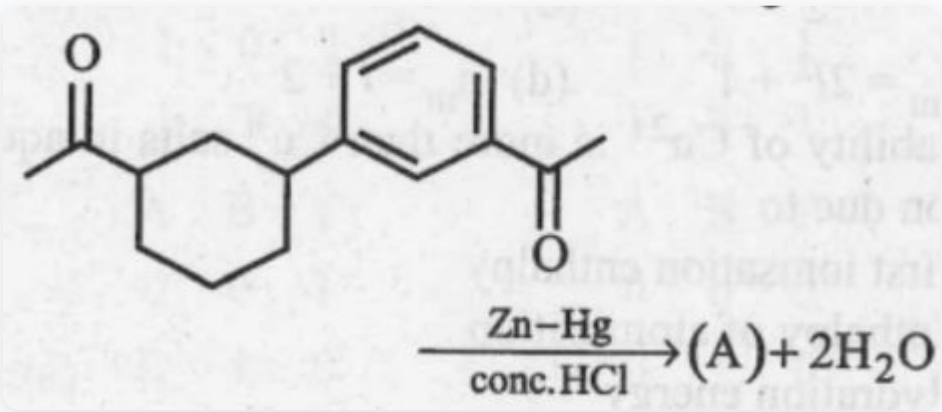
(C) Increase by a factor of nine

(D) Increase by a factor of six

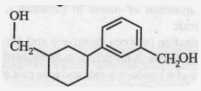
Question 71.

Identify product (A) in the following reaction:

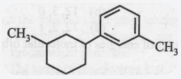
[4 Marks]



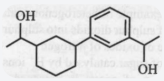
(A)



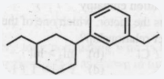
(B)



(C)



(D)



Question 72. Which amongst the following options is correct graphical representation of Boyle's law?

[4 Marks]

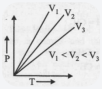
(A)



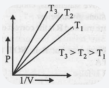
(B)



(C)



(D)



Question 73.

Amongst the given options which of the following molecules/ ion acts as a Lewis acid?

[4 Marks]

(A) NH_3

(B) H_2O

(C) OH^-

(D) BF_3

Question 74.

The element expected to form largest ion to achieve the nearest noble gas configuration is

[4 Marks]

(A) N

(B) F

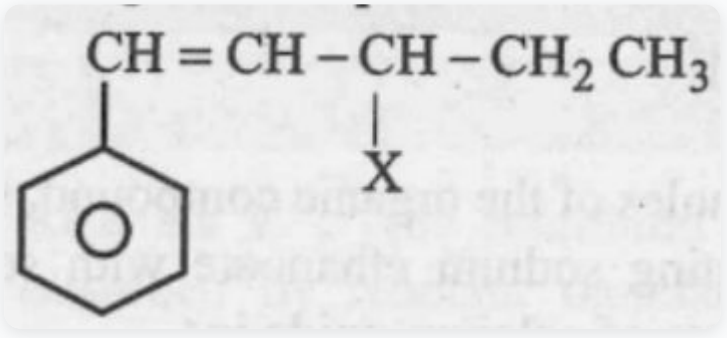
(C) O

(D) Na

Question 75.

The given compound is an example of _____.

[4 Marks]



(A) Vinylic halide

(B) Allylic halide

(C) Benzylic halide

(D) Aryl halide

Question 76.

Given below are two statements :

Statement I : A unit formed by the attachment of a base to 1' position of sugar is known as nucleoside.
Statement II : When nucleoside is linked to phosphorous acid at 5'–position of sugar moiety, we get nucleotide.

In the light of the above statements, choose the correct answer from the options given below :

[4 Marks]

(A) Both Statement I and Statement II are false

(B) Both Statement I and Statement II are true

(C) Statement I is true but Statement II is false

(D) Statement I is false but Statement II is true

Question 77.

Intermolecular forces are forces of attraction and repulsion between interacting particles that will include :

A. dipole – dipole forces

B. dipole - induced dipole forces

C. hydrogen bonding

D. covalent bonding

E. dispersion forces

Choose the most appropriate answer from the options given below :

[4 Marks]

(A) A, C, D, E are correct

(B) A, B, C, E are correct

(C) A, B, C, D are correct

(D) B, C, D, E are correct

Question 78.

Which of the following statements are NOT correct?

A. Hydrogen is used to reduce heavy metal oxides to metals.

B. Heavy water is used to study reaction mechanism.

C. Hydrogen is used to make saturated fats from oils

D. The H–H bond dissociation enthalpy is lowest as compared to a single bond between two atoms of any elements.

E. Hydrogen reduces oxides of metals that are more active than iron.

Choose the most appropriate answer from the options given below:

[4 Marks]

(A) C, D, E only

(B) A, B, C only

(C) B, D only

(D) B, C, D, E only

Question 79. Which one of the following statements is correct?

[4 Marks]

(A) The daily requirement of Mg and Ca in the human body is estimated to be 0.2–0.3 g

(B) All enzymes that utilise ATP in phosphate transfer require Ca as the cofactor

(C) The bone in human body is an inert and unchanging substance

(D) Mg plays roles in neuromuscular function and interneuronal transmission

Question 80.

Match List-I with List-II.

[4 Marks]

List-I	List-II
A. Coke	I. Carbon atoms are sp^3 hybridised
B. Diamond	II. Used as a dry lubricant
C. Fullerene	III. Used as a reducing agent
D. Graphite	IV. Cage like molecules

(A) A–III, B–IV, C–I, D–II

(B) A–III, B–I, C–IV, D–II

(C) A–II, B–IV, C–I, D–III

(D) A–IV, B–I, C–II, D–III

Question 81.

The right option for the mass of CO_2 produced by heating 20 g of 20% pure limestone is (Atomic mass of Ca = 40)

[4 Marks]

$$\left[CaCO_3 \xrightarrow{1200\,K} CaO + CO_2 \right]$$

(A) 1.12 g

(B) 1.76 g

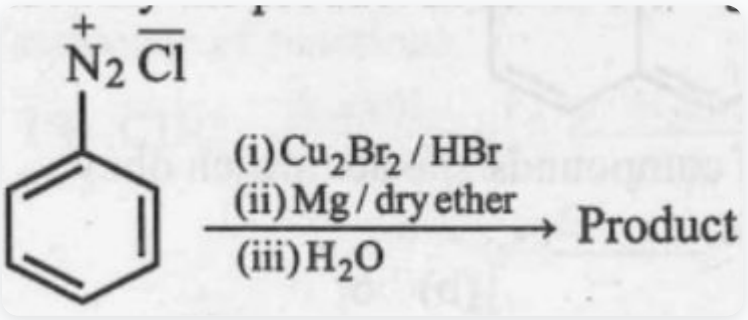
(C) 1.32 g

(D) 2.64 g

Question 82.

Identify the product in the following reaction:

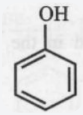
[4 Marks]



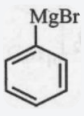
(A)



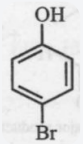
(B)



(C)



(D)



Question 83.

Given below are two statements:

Assertion A : In equation $\Delta_rG = -nFE_{cell}$, value of Δ_rG depends on n

Reasons R : E_{cell} is an intensive property and Δ_rG is an extensive property. In the light of the above statements, choose the correct answer from the options given below

[4 Marks]

(A) Both A and R are true and R is the correct explanation of A

(B) Both A and R are true and R is NOT the correct explanation of A

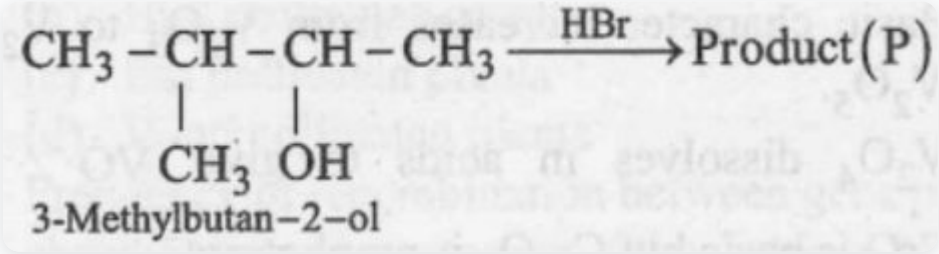
(C) A is true but R is false

(D) A is false but R is true

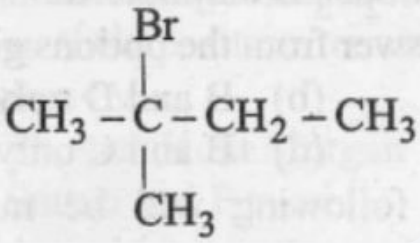
Question 84.

Consider the following reaction and identify the product (P).

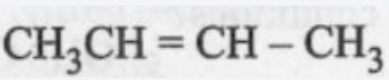
[4 Marks]



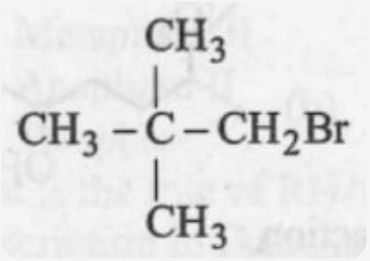
(A)



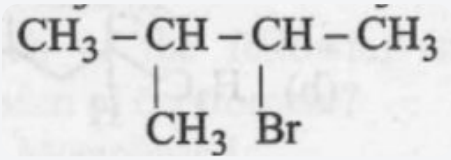
(B)



(C)



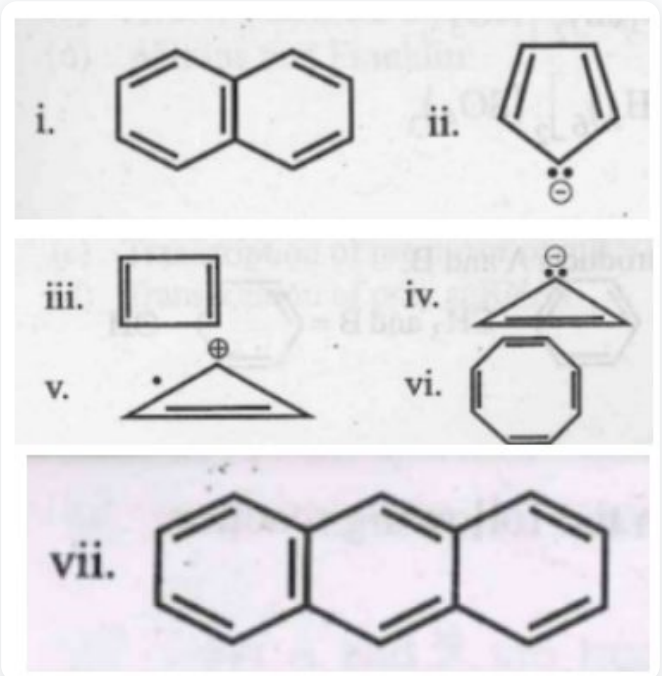
(D)



Question 85.

Consider the following compounds/species: The number of compounds/species which obey Huckel's rule is ____.

[4 Marks]



(A) 5

(B) 6

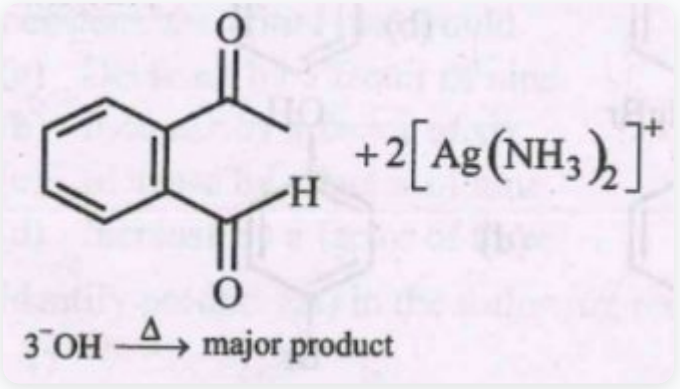
(C) 2

(D) 4

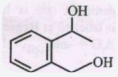
Question 86.

Identify the major product obtained in the following reaction:

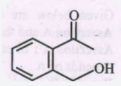
[4 Marks]



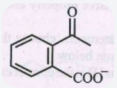
(A)



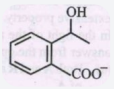
(B)



(C)



(D)



Question 87.

Which of the following statements are INCORRECT?

A. All the transition metals except scandium form MO oxides which are ionic.

B. The highest oxidation number corresponding to the group number in transition metal oxides is attained in Sc_2O_3 to Mn_2O_7.

C. Basic character increases from V_2O_3 to V_2O_4 to V_2O_5.

D. V_2O_4 dissolves in acids to give VO^{2+} salts.

E. CrO is basic but Cr_2O_3 is amphoteric.

Choose the correct answer from the options given below:

[4 Marks]

(A) A and E only

(B) B and D only

(C) C and D only

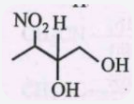
(D) B and C only

Question 88.

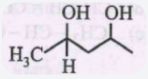
Which amongst the following will be most readily dehydrated under acidic conditions?

[4 Marks]

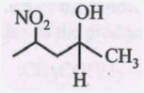
(A)



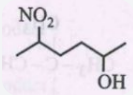
(B)



(C)



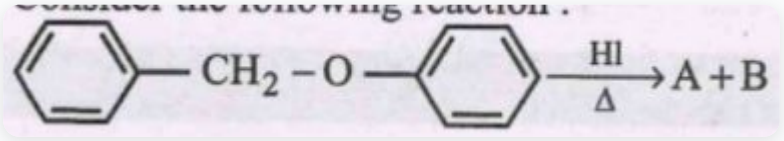
(D)



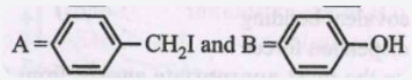
Question 89.

Consider the following reaction : Identify products A and B.

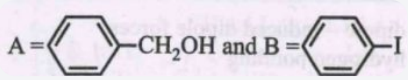
[4 Marks]



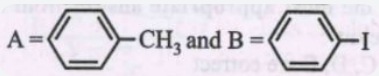
(A)



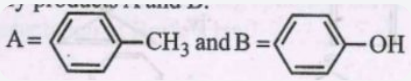
(B)



(C)



(D)



Question 90.

The reaction that does NOT take place in a blast furnace between 900 K to 1500 K temperature range during extraction of iron is :

[4 Marks]

(A) $C + CO_2 \longrightarrow 2CO$

(B) $CaO + SiO_2 \longrightarrow CaSiO_3$

(C) $FeO + CO \longrightarrow Fe + CO_2$

(D) $Fe_2O_3 + CO \longrightarrow 2FeO + CO_2$

Question 91.

Which amongst the following options is the correct relation between change in enthalpy and change in internal energy?

[4 Marks]

(A) $\Delta H + \Delta U = \Delta n_g R$

(B) $\Delta H = \Delta U - \Delta n_g RT$

(C) $\Delta H - \Delta U = -\Delta n_g RT$

(D) $\Delta H = \Delta U + \Delta n_g RT$

Question 92.

On balancing the given redox reaction,

$aCr_2O_7^{2-} + bSO_3^{2-}(aq) + cH^+(aq) \longrightarrow 2aCr^{3+}(aq) + bSO_4^{2-}(aq) + c/2\ H_2O(l)$

the coefficients a, b and c are found to be, respectively–

[4 Marks]

(A) 1, 8, 3

(B) 8, 1, 3

(C) 3, 8, 1

(D) 1, 3, 8

Question 93. What fraction of one edge centred octahedral void lies in one unit cell of fcc?

[4 Marks]

(A) 1/2

(B) 1/3

(C) 1/12

(D) 1/4

Question 94.

Given below are two statements :

Statement I : The nutrient deficient water bodies lead to eutrophication

Statement II : Eutrophication leads to decrease in the level of oxygen in the water bodies. In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) Statement I is incorrect but Statement II is true.

(B) Statement I is correct but Statement II is false.

(C) Both Statement I and Statement II are false.

(D) Both Statement I and Statement II are true.

Question 95.

The equilibrium concentrations of the species in the reaction A + B ⇌ C + D are 2, 3, 10 and 6 mol L^{-1}, respectively at 300 K. ΔG° for the reaction is (R = 2 cal/mol K)

[4 Marks]

(A) -13.73 cal

(B) 1372.60 cal

(C) -1381.80 cal

(D) -137.26 cal

Question 96.

Which complex compound is most stable?

[4 Marks]

(A) $[CoCl_2(en)_2]NO_3$

(B) $[Co(NH_3)_6]_2(SO_4)_3$

(C) $[Co(NH_3)_3(NO_3)_3]$

(D) $Co(NH_3)_4(H_2O)Br_2$

Question 97.

Match List-I with List-II: Choose the correct answer from the options given below.

[4 Marks]

	List-I (Oxoacids of Sulphur)		List-II (Bonds)
A.	Peroxodisulphuric	I.	Two S–OH, acid Four S=O, One S–O–S
B.	Sulphuric acid	II.	Two S–OH, One S=O
C.	Pyrosulphuric acid	III.	Two S–OH, Four S=O, One S–O– O–S
D.	Sulphurous acid	IV.	Two S–OH, Two S=O

(A) A-I, B-III, C-II, D-IV

(B) A-III, B-IV, C-I, D-II

(C) A-III, B-IV, C-II, D-I

(D) A-I, B-III, C-IV, D-II

Question 98. Pumice stone is an example of

[4 Marks]

(A) Sol

(B) Gel

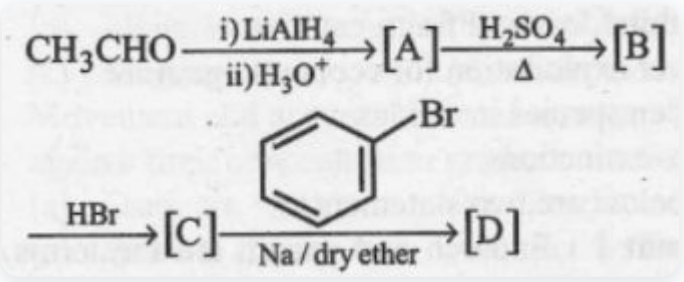
(C) Solid sol

(D) Foam

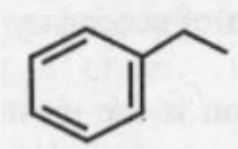
Question 99.

Identify the final product [D] obtained in the following sequence of reactions.

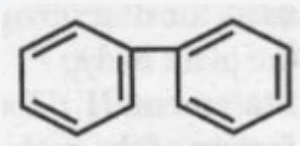
[4 Marks]



(A)



(B)



(C)

C_4H_{10}

(D)

$HC \equiv C^{\ominus}Na^{+}$

Question 100.

Given below are two statements :

Statement I: The forces generated transpiration can lift a xylem-sized column of water over 130 meters height.

Statement II : Transpiration cools leaf surfaces sometimes 10 to 15 degrees evaporative cooling. In the light of the above statements, choose the most appropriate answer from the options given below :

[4 Marks]

(A) Both Statement I and Statement II are correct

(B) Both Statement I and Statement II are incorrect

(C) Statement I is incorrect but Statement II is correct

(D) Statement I is correct but Statement I is incorrect

Question 101.

In gene gun method used to introduce alien DNA into host cells, microparticles of _____ metal are used.

[4 Marks]

(A) Zinc

(B) Copper

(C) Tungsten or gold

(D) Silver

Question 102.

Given below are two statements :

Assertion A : The first stage of gametophyte in the life cycle of moss is protonema stage.

Reason R : Protonema develops directly from spores produced in capsule. In the light of the above statements, choose the most appropriate answer from options given below:

[4 Marks]

(A) Both A and R are correct but R is NOT the correct explanation of A

(B) Both A and R are correct and R is the correct explanation of A

(C) A is not correct but R is correct

(D) A is correct but R is not correct

Question 103.

Unequivocal proof that DNA is the genetic material was first proposed by

[4 Marks]

(A) Avery, Macleoid and McCarthy

(B) Wilkins and Franklin

(C) Alfred Hershey and Martha Chase

(D) Frederick Griffith

Question 104. The thickness of ozone in a column of air in the atmosphere is measured in terms of

[4 Marks]

(A) Decibels

(B) Dobson units

(C) Kilobase

(D) Decamete

Question 105.

In tissue culture experiments, leaf mesophyll cells are put in a culture medium to form callus. This phenomenon may be called as

[4 Marks]

(A) Senescence

(B) Development

(C) Dedifferentiation

(D) Differentiation

Question 106.

Large, colourful, fragrant flowers with nectar are seen in

[4 Marks]

(A) Wind pollinated plants

(B) Insect pollinated plants

(C) Bat pollinated plants

(D) Bird pollinated plants

Question 107.

Frequency of recombination between gene pairs on same chromosome as a measure of the distance between genes to map their position on chromosome, was used for the first time by

[4 Marks]

(A) Henking

(B) Alfred Sturtevant

(C) Thomas Hunt Morgan

(D) Sutton and Boveri

Question 108. Which of the following stages of meiosis involves division of centromere?

[4 Marks]

(A) Metaphase I

(B) Metaphase II

(C) Anaphase II

(D) Telophase

Question 109.

What is the role of RNA polymerase III in the process of transcription in Eukaryotes?

[4 Marks]

(A) Transcription of precursor of mRNA

(B) Transcription of only snRNAs

(C) Transcription of rRNAs (288, 18S and 5.8S)

(D) Transcription of tRNA, 5S rRNA and snRNA

Question 110.

Among ‘The Evil Quartet’, which one is considered the most important cause driving extinction of specie

[4 Marks]

(A) Co-extinctions

(B) Over exploitation for economic gain

(C) Alien species invasions

(D) Habitat loss and fragmentation

Question 111.

Given below are two statements :

Statement I : Endarch and exarch are the terms often used for describing the position of secondary xylem in the plant body.

Statement II : Exarch condition is the most common feature of the root system. In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) Statement I is correct but Statement II is false

(B) Statement I is incorrect but Statement II is true

(C) Both Statement I and Statement I are true

(D) Both Statement I and Statement II are false

Question 112.

Axile placentation is observed in

[4 Marks]

(A) Tomato, Dianthus and Pea

(B) China rose, Beans and Lupin

(C) Mustard, Cucumber and Primrose

(D) China rose, Petunia and Lemon

Question 113.

Expressed Sequence Tags (ESTS) refers to

[4 Marks]

(A) All genes that are expressed as proteins.

(B) Certain important expressed genes.

(C) All genes that are expressed as RNA.

(D) All genes whether expressed or unexpressed.

Question 114.

What is the function of tassels in the corn cob?

[4 Marks]

(A) To trap pollen grains

(B) To protect seeds

(C) To disperse pollen grains

(D) To attract insects

Question 115.

Spraying of which of the following phytohormone on juvenile conifers helps hastening the maturity period, that leads early seed production?

[4 Marks]

(A) Abscisic Acid

(B) Gibberellic Acid

(C) Indole-3-butyric Acid

(D) Zeatin

Question 116.

In the equation [GPP - R = NPP| GPP is Gross Primary Productivity NPP is Net Primary Productivity R here is

[4 Marks]

(A) Reproductive allocation

(B) Respiratory loss

(C) Photosynthetically active radiation

(D) Respiratory quotient

Question 117.

Family Fabaceae differs from Solanaceae and Liliaceae. With respect to the stamens, pick out the characteristics specific to family Fabaceae but not found in Solanaceae or Liliaceae.

[4 Marks]

(A) Monoadelphous and Monothecous anthers

(B) Polyadelphous and epipetalous stamens

(C) Epiphyllous and Dithecous anthers

(D) Diadelphous and Dithecous anthers

Question 118.

In angiosperm, the haploid, diploid and triploid structures of a fertilized embryo sac sequentially are :

[4 Marks]

(A) Synergids, Zygote and Primary endosperm nucleus

(B) Synergids, antipodals and Polar nuclei

(C) Synergids, Primary endosperm nucleus and zygote

(D) Antipodals, synergids, and primary endosperm nucleus

Question 119.

Which hormone promotes internode/petiole elongation in deep water rice?

[4 Marks]

(A) 2, 4-D

(B) Kinetin

(C) Ethylene

(D) GA3

Question 120.

Given below are two statements :

Assertion A : Late wood has fewer xylary elements with narrow vessels.

Reason R : Cambium is less active in winters. In the light of the above statements, choose the correct answer from the options given below

[4 Marks]

(A) A is false but R is true

(B) Both A and R are true but R is NOT the correct explanation of A

(C) A is true but R is false

(D) Both A and R are true and R is the correct explanation of A

Question 121.

Given below are two statements :

Assertion A : ATP is used at two steps in glycolysis.

Reason R : First ATP is used in converting glucose into glucose—6-phosphate and second ATP is used in conversion of fructose—6—phosphate into fructose—1, 6— diphosphate. In the light of the above statements, choose the correct answer from the options given below :

[4 Marks]

(A) Both A and R are true but R is NOT the correct explanation of A.

(B) Both A and R are true and R is the correct explanation of A.

(C) Ais false but R is true.

(D) Ais true but R is false.

Question 122.

Identify the correct statements:

A. Detrivores perform fragmentation.

B. The humus is further degraded by some microbes during mineralization.

C Water soluble inorganic nutrients go down into the soil and get precipitated by a process called leaching.

D. The detritus food chain begins with living organisms.

E. Earthworms break down detritus into smaller particles by a process called catabolism.

Choose the correct answer from the options given below:

[4 Marks]

(A) B,C,D only

(B) C,D,E only

(C) A,B,C only

(D) D,E,A only

Question 123. The process of appearance of recombination nodules occurs at which sub stage of prophase I in meiosis?

[4 Marks]

(A) Pachytene

(B) Diplotene

(C) Zygotene

(D) Diakinesis

Question 124.

How many ATP and NADPH2 are required for the synthesis of one molecule of Glucose during Calvin cycle?

[4 Marks]

(A) 18 ATP and 16 $NADPH_2$

(B) 12 ATP and 12 $NADPH_2$

(C) 12 ATP and 16 $NADPH_2$

(D) 18 ATP and 12 $NADPH_2$

Question 125.

The phenomenon of pleiotropism refers to

[4 Marks]

(A) More than two genes affecting a single character

(B) A single ‘gene affecting multiple phenotypic expression

(C) Presence of two alleles, each of the two genes controlling a single trait

(D) Presence of several alleles of asingle gene controlling a single crossover

Question 126. Upon exposure to UV radiation, DNA stained with ethidium bromide will show

[4 Marks]

(A) Bright red colour

(B) Bright blue colour

(C) Bright yellow colour

(D) Bright orange colour

Question 127.

The reaction centre in PS II has an absorption maxima at

[4 Marks]

(A) 780 nm

(B) 660 nm

(C) 700 nm

(D) 680 nm

Question 128. During the purification process for recombinant DNA technology, addition of chilled ethanol precipitates out

[4 Marks]

(A) DNA

(B) Histones

(C) Polysaccharides

(D) RNA

Question 129.

Which micronutrient is required for splitting of water molecule during photosynthesis?

[4 Marks]

(A) Manganese

(B) Molybdenum

(C) Magnesium

(D) Copper

Question 130. Movement and accumulation of ions across a membrane against their concentration gradient can be explained by

[4 Marks]

(A) Osmosis

(B) Facilitated Diffusion

(C) Passive Transport

(D) Active Transport

Question 131. Among eukaryotes, replication of DNA takes place in :

[4 Marks]

(A) M Phase

(B) S Phase

(C) G_1 Phase

(D) G_2 Phase

Question 132. Cellulose does not form blue colour with Iodine because

[4 Marks]

(A) It is a disaccharide

(B) It is a helical molecule

(C) It breaks down when iodine reacts with it

(D) It does not contain complex helices and hence cannot hold iodine molecules

Question 133.

The historic Convention on Biological Diversity, 'The Earth Summit' was held in Rio de Janeiro in the year

[4 Marks]

(A) 2002

(B) 1986

(C) 1992

(D) 1985

Question 134.

Identify the pair of heterosporous pteridophytes among the following :

[4 Marks]

(A) Psilotum and Salvinia

(B) Equisetum and Salvinia

(C) Selaginella and Salvinia

(D) Lycopodium and Selaginella

Question 135.

Match List I with List II : Choose the correct answer from the options given below :

[4 Marks]

List I		List II	
A.	M Phase	I.	Proteins are synthesized
B.	G_2 Phase	II.	Inactive phase
C.	Quiescent stage	III.	Interval between mitosis and initiation of DNA replication
D.	G_1 Phase	IV.	Equational division

(A) A-II, B-IV, C-I, D-III

(B) A-IV, B-I, C-II, D-III

(C) A-III, B-II, C-IV, D-I

(D) A-IV, B-II, C-I, D-III

Question 136.

Match List I with List II : Choose the correct answer from the options given below:

[4 Marks]

List I		List II	
A.	Iron	I.	Synthesis of auxin
B.	Zinc nitrate reductase	II.	Component of
C.	Boron catalase	III.	Activator of
D.	Molybdenum and differentiation	IV.	Cell elongation

(A) A-III, B-I, C-IV, D-II

(B) A-II, B-IV, C-I, D-III

(C) A-III, B-II, C-I, D-IV

(D) A-II, B-III, C-IV, D-I

Question 137.

Match List I with List II : Choose the correct answer from the options given below:

[4 Marks]

List I		List II	
A.	Cohesion liquid phase	I.	More attraction in
B.	Adhesion among water molecules	II.	Mutual attraction
C.	Surface tension liquid phase	III.	Water loss in
D.	Guttation polar surfaces	IV.	Attraction towards

(A) A-III, B-I, C-IV, D-II

(B) A-II, B-IV, C-I, D-III

(C) A-II, B-I, C-IV, D-III

(D) A-IV, B-III, C-II, D-I

Question 138.

Match List I with List II : Choose the correct answer from the options given below:

[4 Marks]

List I (Interaction)		List II (Species A and B)	
A.	Mutualism	I.	+(A), 0(B)
B.	Commensalism	II.	–(A), 0(B)
C.	Amensalism	III.	+(A), –(B)
D.	Parasitism	IV.	+(A), +(B)

(A) A-IV, B-III, C-I, D-II

(B) A-IV, B-III, C-I, D-II

(C) A-IV, B-II, C-I, D-III

(D) A-IV, B-I, C-II, D-III

Question 139.

Match List I with List II : Choose the correct answer from the options given below:

[4 Marks]

	List I		List II
A.	Oxidative decarboxylation	I.	Citrate synthase
B.	Glycolysis dehydrogenase	II.	Pyruvate
C.	Oxidative phosphorylation	III.	Electron transport system
D.	Tricarboxylic acid cycle	IV.	EMP pathway

(A) A-II, B-IV, C-III, D-I

(B) A-III, B-I, C-II, D-IV

(C) A-II, B-IV, C-I, D-III

(D) A-III, B-IV, C-I, D-II

Question 140.

How many different proteins does the ribosome consist of?

[4 Marks]

(A) 20

(B) 40

(C) 80

(D) 60

Question 141.

Main steps in the formation of Recombinant DNA are given below. Arrange these steps in a correct sequence.

A. Insertion of recombinant DNA into the host cell

B. Cutting of DNA at specific location by restriction enzyme

C. Isolation of desired DNA fragment

D. Amplification of gene of interest using PCR

Choose the correct answer from the options given below:

[4 Marks]

(A) B,C,D,A

(B) C,B,D,A

(C) B,D,A,C

(D) C,A,B,D

Question 142.

Given below are two statements:

Statement I : Gause's 'Competitive Exclusion Principle' states that two closely related species competing for the same resources cannot co-exist indefinitely and competitively inferior one will be eliminated eventually.

Statement II : In general, carnivores are more adversely affected by competition than herbivores. In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) Both Statement I and Statement II are true.

(B) Both Statement I and Statement II are false.

(C) Statement I is incorrect but Statement II is true.

(D) Statement I is correct Statement II is false.

Question 143.

Given below are two statements :

Assertion A : A flower is defined as modified shoot wherein the shoot apical meristem changes to floral meristem.

Reason R : Internode of the shoot gets condensed to produce different floral appendages laterally at successive node instead of leaves. In the light of the above statements, choose the correct answer from the options given below :

[4 Marks]

(A) Both A and R are true and R is the correct explanation of A

(B) Both A and R are true but R is NOT the correct explanation of A

(C) A is true but R is false

(D) A is false but R is true

Question 144.

Which of the following statements are correct about Klinefelter's Syndrome?

A. This disorder was first described by Langdon Down (1866).

B. Such an individual has overall masculine development. However, the feminine development is also expressed.

C. The affected individual is short statured.

D. Physical, psychomotor and mental development is retarded.

E. Such individuals are sterile.

Choose the correct answer from the options given below:

[4 Marks]

(A) A and E only

(B) B and E only

(C) C and D only

(D) A and B only

Question 145. Melonate inhibits the growth of pathogenic bacteria by inhibiting the activity of

[4 Marks]

(A) Amylase

(B) Succinic dehydrogenase

(C) Lipase

(D) Dinitrogenase

Question 146. Which one of the following statements is NOT correct?

[4 Marks]

(A) Algal blooms caused by excess of organic matter in ‘water improve water quality and promote fisheries

(B) The micro-organisms involved in biodegradation of organic matter in a sewage polluted water body consume a lot of oxygen causing the death of aquatic organisms.

(C) ‘Water hyacinth grows abundantly in eutrophic water bodies and leads to an imbalance in the ecosystem dynamics of the water body

(D) The amount of some toxic substances of industrial waste water increases in the organisms at successive trophic levels

Question 147.

Which of the following combinations is required for chemiosmosis?

[4 Marks]

(A) Proton pump, electron gradient, NADP synthase

(B) Proton pump, electron gradient, ATP synthase

(C) Membrane, proton pump, proton gradient, ATP synthase

(D) Membrane, proton pump, proton gradient, NADP synthase

Question 148.

Identify the correct statements:

A. Lenticels are the lens-shaped openings permitting the exchange of gases.

B. Bark formed early in the season is called hard bark.

C. Bark is a technical term that refers to all tissues exterior to vascular cambium.

D. Bark refers to periderm and secondary phloem.

E. Phellogen is single-layered in thickness.

Choose the correct answer from the options given below:

[4 Marks]

(A) B and C only

(B) A and D only

(C) B,C and E only

(D) A,B and D only

Question 149.

Given below are two statements

: Assertion A : In gymnosperms the pollen grains are released from the microsporangium and carried by air currents.

Reason R : Air currents carry the pollen grains to the mouth of the archegonia where the male gametes are discharged and pollen tube is not formed. In the light of the above statements, choose the correct answer from the options given below :

[4 Marks]

(A) Both A and R are true but R is NOT the current explanation of A

(B) Both A and R are true and R is the correct explanation of A

(C) A is true but R is false

(D) A is false but R is true

Question 150. Which of the following is not a cloning vector?

[4 Marks]

(A) BAC

(B) YAC

(C) pBR322

(D) Probe

Question 151. Broad palm with single palm crease is visible in a person suffering from—

[4 Marks]

(A) Down's syndrome

(B) Turner's syndrome

(C) Klinefelter's syndrome

(D) Thalassemia

Question 152.

Which of the following are NOT considered as the part of endomembrane system?

A. Mitochondria

B. Endoplasmic reticulum

C. Chloroplasts

D. Golgi complex

E. Peroxisomes

Choose the most appropriate answer from the options given below:

[4 Marks]

(A) B and D only

(B) A, C and E only

(C) A, D and E only

(D) A and D only

Question 153. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	List I		List II
A.	Taenia	I.	Nephridia
B.	Paramoecium	II.	Contractile vacuole
C.	Periplaneta	III.	Flame cells
D.	Pheretima	IV.	Urecose gland

(A) A-I, B-II, C-III, D-IV

(B) A-I, B-II, C-IV, D-III

(C) A-II, B-I, C-IV, D-III

(D) A-III, B-II, C-IV, D-I

Question 154.

Given below are two statements:

Assertion A : Amniocentesis for sex determination is one of the strategies of Reproductive and Child Health Care Programme.

Reason R : Ban on amniocentesis checks increasing menace of female foeticide. In the light of the above statements, choose the correct answer from the options given below.

[4 Marks]

(A) Both A and R are true and R is NOT the correct explanation of A.

(B) Both A and R are true and R is the correct explanation of A.

(C) A is false but R is true.

(D) A is true but R is false.

Question 155.

Given below are two statements:

Statement I: Ligaments are dense irregular tissue.

Statement II: Cartilage is dense regular tissue. In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) Both Statement I and Statement II are false

(B) Both Statement I and Statement II are true

(C) Statement I is true but Statement II is false

(D) Statement I is false but Statement II is true

Question 156.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	List I		List II
A.	P–wave	I.	Beginning of systole
B.	Q–wave	II.	Repolarisation of ventricles
C.	QRS complex	III.	Depolarisation of atria
D.	T–wave	IV.	Depolarisation of ventricles

(A) A-II, B-IV, C-I, D-II

(B) A-I, B-II, C-III, D-IV

(C) A-IV, B-II, C-II, D-I

(D) A-III, B-I, C-IV, D-II

Question 157.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	List I		List II
A.	Vasectomy	I.	Oral method
B.	Coitus interruptus	II.	Barrier method
C.	Cervical caps	III.	Surgical method
D.	Saheli	IV.	Natural method

(A) A-IV, B-II, C-I, D-III

(B) A-III, B-IV, C-II, D-I

(C) A-III, B-I, C-IV, D-II

(D) A-II, B-III, C-I, D-IV

Question 158. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

List I (Cells)	List II (Secretion)
A. Peptic cells	I. Mucus
B. Goblet cells	II. Bile juice
C. Oxyntic cells	III. Proenzyme pepsinogen
D. Hepatic cells	IV. HCl and intrinsic factor for absorption of vitamin B_{12}

(A) A-II, B-I, C-III, D-IV

(B) A-IV, B-III, C-II, D-I

(C) A-II, B-IV, C-I, D-II

(D) A-III, B-I, C-IV, D-II

Question 159.

Given below are two statements: Statement I: Vas deferens receives a duct from seminal vesicle and opens into urethra as the ejaculatory duct. Statement II: The cavity of the cervix is called cervical canal which along with vagina forms birth canal, In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) Statement I is incorrect but Statement I is true.

(B) Both Statement I and Statement II are false.

(C) Both Statement I and Statement II are true.

(D) Statement I is correct but Statement II is false.

Question 160.

Given below are two statements:

Assertion A: Nephrons are of two types: Cortical & Juxta medullary, based on their relative position in cortex and medulla.

Reason R: Juxta medullary nephrons have short loop of Henle whereas, cortical nephrons have longer loop of Henle. In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) Ais false but R is true.

(B) Both A and R are true but R is NOT the correct explanation of A.

(C) Adis true but R is false.

(D) Both A and R are true and R is the correct explanation ofA.

Question 161. Given below are two statements: Statement I : Low temperature preserves the enzyme in a temporarily inactive state whereas high temperature destroys enzymatic activity because proteins are denatured by heat. Statement II: When the inhibitor closely resembles the substrate in its molecular structure and inhibits the activity of the enzyme, it is known as competitive inhibitor. In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) Both Statement I and Statement II are true.

(B) Both Statement I and Statement II are false.

(C) Statement I is true but Statement II is false.

(D) Statement I is false but Statement II is true.

Question 162.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

List I		List II	
A.	Gene 'a'	I.	β-galactosidase
B.	Gene 'y'	II.	Transacetylase
C.	Gene 'i'	III.	Permease
D.	Gene 'z'	IV.	Repressor protein

(A) A-II, B-I, C-IV, D-III

(B) A-II, B-III, C-IV, D-I

(C) A-III, B-I, C-IV, D-II

(D) A-IIL, B-IV, C-I, D-II

Question 163.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

List I	List II
A. Ringworm	I. *Haemophilus influenzae*
B. Filariasis	II. *Trichophyton*
C. Malaria	III. *Wuchereria bancrofti*
D. Pneumonia	IV. *Plasmodium vivax*

(A) A-IIL, B-II, C-IV, D-I

(B) A-III, B-II, C-I, D-IV

(C) A-II, B-III, C-I, D-IV

(D) A-II, B-III, C-IV, D-I

Question 164.

Which of the following functions is carried out by cytoskeleton in a cell?

[4 Marks]

(A) Transportation

(B) Motility

(C) Protein synthesis

(D) Nuclear division

Question 165.

Which of the following statements is correct?

[4 Marks]

(A) Biomagnification refers to increase in concentration of the toxicant at successive trophic levels.

(B) Eutrophication refers to increase in domestic sewage and waste water in lakes.

(C) Presence of large amount of nutrients in water restricts ‘Algal Bloom’

(D) Algal Bloom decreases fish mortality

Question 166.

Match List I with List II.

Choose the correct answer from the options given below:

[4 Marks]

List I		List II	
A.	Heroin	I.	Effect on cardiovascular system
B.	Marijuana	II.	Slow down body function
C.	Cocaine	III.	Painkiller
D.	Morphine	IV.	Interfere with transport of dopamine

(A) A-II, B-I, C-IV, D-III

(B) A-I, B-II, C-III, D-IV

(C) A-IV, B-III, C-II, D-I

(D) A-III, B-IV, C-I, D-II

Question 167.

Radial symmetry is NOT found in adults of phylum ____.

[4 Marks]

(A) Ctenophora

(B) Hemichordata

(C) Coelenterata

(D) Echinodermata

Question 168.

Given below are two statements:

Statement I: In prokaryotes, the positively charged DNA is held with some negatively charged proteins in a region called nucleoid.

Statement II: In eukaryotes, the negatively charged DNA is wrapped around the positively charged histone octamer to form nucleosome.

In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) Statement I is incorrect but Statement IT is true.

(B) Both Statement I and Statement II are false.

(C) Statement I is correct but Statement I is false.

(D) Both Statement I and Statement II are true.

Question 169.

Which of the following statements are correct regarding female reproductive cycle?

A. In non-primate mammal's cyclical changes during reproduction are called oestrus cycle.

B. First menstrual cycle begins at puberty and is called menopause.

C. Lack of menstruation may be indicative of pregnancy.

D. Cyclic menstruation extends between menarche and menopause.

Choose the most appropriate answer from the options given below.

[4 Marks]

(A) A, C and D only

(B) A, B and C only

(C) A and B only

(D) A and D only

Question 170.

Select the correct group/set of Australian Marsupials exhibiting adaptive radiation.

[4 Marks]

(A) Tasmanian wolf, Bobcat, Marsupial mole

(B) Lemur, Anteater, Wolf

(C) Numbat, Spotted cuscus, Flying phalanger

(D) Mole, Flying squirrel, Tasmanian tiger cat

Question 171.

Which one of the following techniques does not serve the purpose of early diagnosis of a disease for its early treatment?

[4 Marks]

(A) Recombinant DNA Technology

(B) Serum and Urine analysis

(C) Enzyme Linked Immuno-Sorbent Assay (ELISA) technique

(D) Polymerase Chain Reaction (PCR) technique

Question 172.

Match List I with List II.

Choose the correct answer from the options given below:

[4 Marks]

	List I (Type of Joint)		List II (Found between)
A.	Cartilaginous Joint	I.	Between flat skull bones
B.	Ball and Socket Joint	II.	Between adjacent vertebrae in vertebral column
C.	Fibrous Joint	III.	Between carpal and metacarpal of thumb
D.	Saddle Joint	IV.	Between Humerus and Pectoral girdle

(A) A-II, B-IV, C-III, D-I

(B) A-I, B-IV, C-III, D-II

(C) A-II, B-IV, C-I, D-III

(D) A-III, B-I, C-II, D-IV

Question 173.

Match List I with List II.

Choose the correct answer from the options given below:

[4 Marks]

	List I (Interacting species)		List II (Name of interaction)
A.	A Leopard and a Lion in a forest/ grassland	I.	Competition
B.	A Cuckoo laying egg in a Crow's nest	II.	Brood parasitism
C.	Fungi and root of a higher plant in Mycorrhizae	III.	Mutualism
D.	A cattle egret and a Cattle in a field	IV.	Commensalism

(A) A-I, B-II, C-IV, D-III

(B) A-II, B-III, C-I, D-IV

(C) A-III, B-IV, C-I, D-II

(D) A-I, B-II, C-III, D-IV

Question 174.

Vital capacity of lung is ____.

[4 Marks]

(A) IRV + ERV + TV - RV

(B) IRV + ERV

(C) IRV + ERV + TV + RV

(D) IRV + ERV + TV

Question 175.

Match List I with List II.

Choose the correct answer from the options given below:

[4 Marks]

	List I		List II
A.	Fovea portion of eye that regulates diameter of pupil.	I.	Visible coloured
B.	Iris eye formed of dense connective tissue.	II.	External layer of
C.	Blind spot visual acuity or resolution.	III.	Point of greatest
D.	Sclera optic nerve leaves the eyeball and photoreceptor cells are absent.	IV.	Point where

(A) A-III, B-I, C-IV, D-II

(B) A-I, B-IV, C-II, D-II

(C) A-II, B-I, C-III, D-IV

(D) A-IV, B-III, C-II, D-I

Question 176.

Once the undigested and unabsorbed substances enter the caecum, their backflow is prevented by

[4 Marks]

(A) Sphincter of Oddi

(B) Ileo-caecal valve

(C) Gastro-oesophageal sphincter

(D) Pyloric sphincter

Question 177.

Which one of the following common sexually transmitted diseases is completely curable when detected early and treated properly?

[4 Marks]

(A) HIV Infection

(B) Hepatitis-B

(C) Gonorrhoea

(D) Genital herpes

Question 178.

Given below are two statements:

Statement I: A protein is imagined as a line, the left end represented by first amino acid (C-terminal) and the right end represented by last amino acid (N=terminal).

Statement II: Adult human haemoglobin, consists of 4 subunits (two subunits of a type and two sub-units of b type.)

In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) Both Statement I and Statement I are true

(B) Statement I is true but Statement IT is false.

(C) Statement I is true but Statement IT is false.

(D) Both Statement I and Statement I are true

Question 179.

Given below are two statements:

Statement I: Electrostatic precipitator is most widely used in thermal power plant.

Statement II : Electrostatic precipitator in thermal power plant removes ionising radiations.

In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) Both Statement I and Statement IT are correct.

(B) Both Statement I and Statement II are incorrect.

(C) Statement I is correct but Statement II is incorrect.

(D) Statement I is incorrect but Statement II is correct.

Question 180.

In which blood corpuscles, the HIV undergoes replication and produces progeny viruses?

[4 Marks]

(A) TH cells

(B) B-lymphocytes

(C) Basophils

(D) Eosinophils

Question 181.

Given below are two statements:

Statement I: RNA mutates at a faster rate.

Statement II: Viruses having RNA genome and shorter life span mutate and evolve faster.

In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) Both Statement I and Statement II are true.

(B) Statement I is false but Statement II is true.

(C) Both Statement I and Statement II are false.

(D) Statement I is true but Statement II is false.

Question 182.

Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A: Endometrium is necessary for implantation of blastocyst.

Reason R: In the absence of fertilization, the corpus luteum degenerates that causes disintegration of endometrium.

In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(A) A is true but R is false.

(B) A is false but R is true.

(C) Both A and R are true but R is NOT the correct explanation of A.

(D) Both A and R are true and R is the correct explanation of A.

Question 183.

Match List I with List II.

Choose the correct answer from the options given below:

[4 Marks]

List I		List II	
A.	CCK	I.	Kidney
B.	GIP	II.	Heart
C.	ANF	III.	Gastric gland
D.	ADH	IV.	Pancreas

(A) A-IV, B-III, C-II, D-I

(B) A-III B-II, C-IV, D-I

(C) A-II, B-IV, C-I, D-III

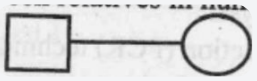
(D) A-IV, B-II, C-III, D-I

Question 184.

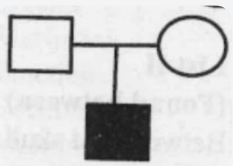
Which one of the following symbols represents mating between relatives in human pedigree analysis?

[4 Marks]

(A)



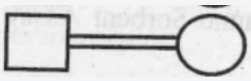
(B)



(C)



(D)



Question 185.

The unique mammalian characteristics are:

[4 Marks]

(A) hairs, tympanic membrane and mammary glands

(B) hairs, pinna and mammary glands

(C) pinna, monocondylic skull and mammary glands

(D) hairs, pinna and indirect development

Question 186.

Which of the following statements are correct?

A. Basophils are most abundant cells of the total WBCs

B. Basophils secrete histamine, serotonin and heparin

C. Basophils are involved in inflammatory response

D. Basophils have kidney shaped nucleus

Choose the correct answer from the options given below:

[4 Marks]

(A) A and B only

(B) B and C only

(C) C and E only

(D) D and E only

Question 187.

Select the correct statements with reference to chordates.

A. Presence of a mid-dorsal, solid and double nerve cord.

B. Presence of closed circulatory system.

C. Presence of paired pharyngeal gill slits.

D. Presence of dorsal heart

E. Triploblastic pseudocoelomate animals.

Choose the correct answer from the options given below:

[4 Marks]

(A) A, C and D only

(B) B and C only

(C) C, D and E only

(D) B, D and E only

Question 188.

Which of the following are NOT under the control of thyroid hormone?

A. Maintenance of water and electrolyte balance

B. Regulation of basal metabolic rate

C. Normal rhythm of sleep-wake cycle

D. Development of immune system

E. Support the process of RBCs formation

Choose the correct answer from the options given below:

[4 Marks]

(A) A and D only

(B) B and C only

(C) C and D only

(D) D and E only

Question 189.

In cockroach, excretion is brought about by —

A. Phallic gland

B. Urecose gland

C. Nephrocytes

D. Fatbody

E. Collaterial glands

Choose the correct answer from the options given below:

[4 Marks]

(A) Band D only

(B) B ,C and D only

(C) A, B and E Only

(D) A and E only

Question 190.

The parts of human brain that helps in regulation of sexual behaviour, expression of excitement, pleasure, rage, fear etc. are:

[4 Marks]

(A) Corpus callosum and thalamus

(B) Brain stem and epithalamus

(C) Corpora quadrigemina and hippocampus

(D) Limbic system and hypothalamus

Question 191.

Match List I with List II.

Choose the correct answer from the options given below:

[4 Marks]

	List I		List II
A.	Mast cells	I.	Ciliated epithelium
B.	Inner surface of bronchiole	II.	Areolar connective tissue
C.	Blood epithelium	III.	Cuboidal
D.	Tubular parts of nephron	IV.	Specialised connective tissue

(A) A-III B-IV, C-II, D-I

(B) A-II, B-I, C-IV, D-III

(C) A-II, B-III, C-I, D-IV

(D) A-I, B-II, C-IV, D-III

Question 192.

Match List I with List II.

Choose the correct answer from the options given below:

[4 Marks]

	List I		List II
A.	Logistic growth availability condition	I.	Unlimited resource
B.	Exponential growth condition	II.	Limited resource availability
C.	Expanding age pyramid of pre-reproductive age is largest followed by reproductive and post reproductive age groups	III.	The percent individuals
D.	Stable age pyramid prc-rcproductives and reproductive age group are same	IV.	The percent individuals of

(A) A-II, B-I, C-III, D-IV

(B) A-II, B-IV, C-III, D-I

(C) A-II, B-III, C-I, D-IV

(D) A-II, B-IV, C-I, D-III

Question 193.

Which of the following statements are correct?

A. An excessive loss of body fluid from the body switches off osmoreceptors.

B. ADH facilitates water reabsorption to prevent diuresis.

C. ANF causes vasodilation.

D. ADH causes increase in blood pressure.

E. ADH is responsible for decrease in GFR.

Choose the correct answer from the options given below:

[4 Marks]

(A) A and B only

(B) B, C and D only

(C) A, B and E only

(D) C, D and E only

Question 194.

Given below are two statements:

Statement I : During GO phase of cell cycle, the cell is metabolically inactive.

Statement II : The centrosome undergoes duplication during S phase of interphase

In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) Both Statement I and Statement I are correct

(B) Both Statement I and Statement II are incorrect.

(C) Both Statement I and Statement II are incorrect.

(D) Statement I is incorrect but Statement II is correct.

Question 195.

Select the correct statements.

A. Tetrad formation is seen during Leptotene.

B. During Anaphase, the centromeres split and chromatids separate.

C. Terminalization takes place during Pachytene.

D. Nucleolus, Golgi complex and ER are reformed during Telophase.

E. Crossing over takes place between sister chromatids of homologous chromosome.

Choose the correct answer from the options given below:

[4 Marks]

(A) A and C only

(B) B and D only

(C) A, C and E only

(D) B and E only

Question 196.

Which one of the following is NOT an advantage of inbreeding?

[4 Marks]

(A) It exposes harmful recessive genes butare eliminated by selection.

(B) It decreases the productivity of inbred population, after continuous inbreeding.

(C) Elimination of less desirable genes and accumulation of superior genes takes place due to it.

(D) It decreases homozygosity.

Question 197.

Which of the following is characteristic feature of cockroach regarding sexual dimorphism?

[4 Marks]

(A) Presence of anal cerci

(B) Presence of sclerites

(C) Dark brown body colour and anal cerci

(D) Presence of anal styles

Question 198.

Which one of the following is the sequence on corresponding coding strand, if the sequence on mRNA formed is as follows

5’ AUCGAUCGAUCGAUCGAUCGAUCGAUCG 3'?

[4 Marks]

(A) 5’ ATCGATCGATCGATCGATCGATCG 3’

(B) 3’ ATCGATCGATCGATCGATCGATCG 5'

(C) 5 ’GCUAGCUAGCUAGCUAGCUAGC 3'

(D) 3’ GCUAGCUAGCUAGCUAGCUAGC 5’

Question 199.

Which of the following statements are correct regarding skeletal muscle?

A. Muscle bundles are held together by collagenous connective tissue layer called fascicle.

B. Sarcoplasmic reticulum of muscle fibre is a store house of calcium ions.

C. Striated appearance of skeletal muscle fibre is due to distribution pattern of actin and myosin proteins.

D. Mline is considered as functional unit of contraction called sarcomere.

Choose the most appropriate answer from the options given below:

[4 Marks]

(A) B and C only

(B) C and D only

(C) A, C and D only

(D) A, B and C only

Question 200.

‘Which of the following reactions will NOT give primary amine as the product?

[4 Marks]

(A)

$$CH_3CONH_2 \xrightarrow[(ii)\,H_3O^{\oplus}]{(i)\,LiAlH_4} \text{Product}$$

(B)

$$CH_3NC \xrightarrow[(ii)\,H_3O^{\oplus}]{(i)\,LiAlH_4} \text{Product}$$

(C)

$$CH_3CN \xrightarrow[(ii)\,H_3O^{\oplus}]{(i)\,LiAlH_4} \text{Product}$$

(D)

$$CH_3CONH_2 \xrightarrow{Br_2/KOH} \text{Product}$$